



MIRALLOY® For the Clothing Industry

Copper-tin-(zinc) electrolytes as nickel-free alternatives

Since 1981, MIRALLOY® has been a good alternative for nickel-free coatings in the clothing industry. Today, our customers all over the world profit from more than 30 years of experience and the continuous further development of the product series.

With MIRALLOY®, electrolytes are used to deposit copper-tin-(zinc) coatings in rack and barrel plating. The colour of the coatings is white – similar to silver.

Plated garment accessories, such as zips and metal buttons, offer a very high level of resistance to everyday wear.

A further plating layer with gold, rhodium, palladium or other precious metals, as well as tarnish protection if required, can be added problem-free by choosing a suitable process and with the right pre-treatment.



Electrolyte characteristics

Electrolyte type	Alkaline-cyanide
Metal content	8.5 g/l Cu 34.0 g/l Sn 0.75 g/l Zn
pH value	> 13
Operating temperature	60 °C
Current density range	0.5 (0.3 - 1.0) A/dm ²
Plating speed	Approx. 0.12 µm/ min at 0.5 A/dm ²
Anode material	MMO (type PLATINODE® 167, graphite)

Coating characteristics

Coating Copper-tin-zinc

Alloy composition	55 wt. % Cu 30 wt. % Sn 15 wt. % Zn
Colour of deposit	White
Brightness	Bright
Hardness	550 HV
Max. coating thickness	5 µm
Density of the coating	8.2 g/cm ³

Advantages

- Copper-tin-(zinc) alloy coatings
- Bright white coatings (similar to silver)
- Diamagnetic
- Nickel-free (§27 of REACH, Ann. XVII, Reg. (EC) No 1907/2006, Standard 100 by OEKO-Tex®)
- Free from heavy metals like Cr, Pb, Co, Th etc.
- Resistant to tarnishing and corrosion
- Excellent layer thickness distribution
- Wide operating range
- Can be lacquered
- Can be combined with precious metals
- The coatings are RoHS compliant
- Tried and tested process by many zip manufacturers

Applications

- Zip parts
- Metal buttons
- Bra fasteners
- Buckles
- Haberdashery

MIRALLOY® Copper-Tin-(Zinc) Electrolytes for the Clothing Industry:

- MIRALLOY® 2841 (white) for rack and barrel operation
- MIRALLOY® 2844/LC/E (white) for barrel and rack operation
- MIRALLOY® 2850 (white) for rack and barrel operation

European Nickel Regulation

In Europe 15 to 20 per cent of all women and about five percent of all men are allergic to nickel. For this reason, legislators issued the 7th change to the Consumer Goods Act; the European Nickel Act (§27, Ann. XVII, Reg. (EC) No 1907/2006): Earrings and comparable objects remaining in a wound during the healing process may not contain more than 0.5 % by weight of nickel.

Objects intended to come into direct and prolonged contact with the skin (e. g. earrings, necklaces, rings, watches, buttons etc.) were not permitted if the part of the product that would come into prolonged contact with the skin released more than 0.5 µg/cm²/week of nickel.

When using nickel-free plating, it must be guaranteed that the part of the product that will be in direct and prolonged contact with the skin does not release more than 0.5 µg/cm²/week of nickel in two years under normal circumstances.

Definition of Prolonged Skin Contact (ECHA Q&A no935)

The ECHA (European Chemical Agency) developed a scientifically supported interpretation of 'prolonged skin contact': Prolonged contact with the skin is defined as potential contact between the skin and items containing nickel for more than

- 10 minutes for three or more occasions within two weeks, or
- 30 minutes for one or more occasions within two weeks.

Apart from clothing accessories, this regulation affects a number of consumer goods such as costume jewellery, craft tools, writing utensils, spectacle frames, work tools, kitchen appliances and electronic devices.

Your contact person



Markus Legeler
Manager Sales International
T: +49 7171 607 204
F: +49 7171 607 316
markus.legeler@eu.umicore.com